DOCUMENT RESUME

ED 360 911 HE 026 649

AUTHOR Cooper, Pamela A.; Hensley, Oliver D.
TITLE Faculty Perceptions of Measures of Activity and Productivity. AIR 1993 Annual Forum Paper.
PUB DATE May 93
NOTE 29p.; Paper presented at the Annual Forum of the Association for Institutional Research (33rd, Chicago, IL, May 16-19, 1993).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Accountability; *College Faculty; Engineering Education; *Evaluation Criteria; Faculty Publishing; Higher Education; *Productivity; Research and Development; Science Teachers; *Teacher Attitudes
IDENTIFIERS *AIR Forum; Faculty Productivity Reports

ABSTRACT

A study was done of faculty perceptions of the accuracy and validity of various time-related personnel activity and productivity reporting measures, and of faculty's willingness to participate in these measures. In the first stage of the study 1,000 randomly-selected faculty from 200 institutions of higher education that have the highest levels of total separately budgeted science/engineering research and development expenditures were mailed a survey instrument entitled "Faculty Perceptions of Activity and Productivity Reporting." Faculty responses included suggestions for activity and productivity measures and those suggestions appeared in a followup survey, "Faculty Perceptions of Measures of Productivity," sent to the original cohort and an additional 10,000 science and engineering research and development faculty. The first survey received a 24 percent response rate; the second a 21 percent response rate. Results indicated that faculty think that reporting the percentage of time spent in various activities or the number of hours in the classroom is not a valid measure of their productivity. However, reliance on time-based reporting systems must prevail until institutions of higher education and faculty become accountable to their sponsors and begin to develop, implement, and make external and internal reports based on measures of faculty productivity. (Includes 13 references.) (JB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 360 911

Faculty Perceptions of Measures of Activity and Productivity

Presented at

The Association for Institutional Research

33rd Annual Forum

Chicago, Illinois

May 16-19, 1993

Dr. Pamela A. Cooper
Development and External Relations Officer
Texas Tech University
Lubbock, TX 70409-0002
(806) 742-1348

Dr. Oliver D. Hensley
Professor of Higher Education
Texas Tech University
Lubbock, TX 79409-1071
(806) 742-1959

HE 026 649

BEST COPY AVAILABLE

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it

☐ Minor changes have been made to improve reproduction quality

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

AIR

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

for Management Research, Policy Analysis, and Planning

This paper was presented at the Thirty-Third Annual Forum of the Association for Institutional Research held at the Chicago Marriott Downtown, Chicago, Illinois, May 16-19, 1993. This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of Forum Papers.

Jean Endo
Chair and Editor
Forum Publications
Editorial Advisory Committee

Abstract

There has been little insistence that expenditures of federal, state or private funds, or that the conduct of instruction, research or service, should be related to measures of faculty productivity.

The faculty's reluctance to participate in current reporting measures is partially because they do not feel they are accurate or valid measures. Prior to this study, no one had bothered to ask the faculty what they considered to be valid measures.

Measures that surveyed faculty rate as most valid are not always those that the Federal and state governments rely upon, or that are most commonly cited in the literature.

University faculty and administrators have not wanted to concern themselves with accountability issues. They have complained over the years concerning the inaccuracy and nonvalidity of, and the bureaucracy and paperwork associated with the federally required, time-based Personnel Activity Reporting, yet they themselves have not attempted to identify or implement more appropriate measures of accountability.

The concept of "faculty load," or the amount of work a faculty member does, has dominated discussions in academia of faculty productivity since World War II. By the late 1950s, many institutions, for administrative and fiscal reasons, were attempting to measure faculty load through various methods.

The concept of Faculty Activity Analyses (FAA), or systems developed to record and report faculty efforts and activities for operational analysis, was developed in the 1950s in an attempt to answer legislative requests, equalize faculty loads, develop unit cost measures and develop common measures of faculty activity. By the 1960s, increasingly complex budgets, legislative demands for substantiation of funding requests, and federal and state audits created an environment in which more universities were undertaking FAA's in an attempt to determine how the faculty were spending their time (Swann, Saunders, Simpson & Woolley, 1977).

Since FAA systems were developed to meet the unique needs of each university, all of this uncertainty and lack of consistency lead Ingster (1977) to note that the attempt to define productivity for faculty is "almost hopeless," and he charged that criteria such as student/faculty ratios and weekly hours of work are not significant indicators of levels of productivity.

A general consensus of the output measures necessary for the conduct of

these evaluations is not readily available. Studies in the areas of teaching, service and administration are practically non-existent. Even in the area of research productivity output measures, Creswell (1985) indicated that:

> the measures of research productivity in empirical investigations are excessively narrow. Beyond publication and citation counts, researchers employ few measures. Yes, the criteria used to assess research performance vary widely from one type of institution to another. Empirical studies should examine broader measures of research (e.g., grants obtained, patents, creative projects, and others) and determine the correlates that have positive predictive influence (p. 55).

By 1989, it was noted that little attention had been given to the development of indicators of faculty performance (Kurz, Mueller, Gibbons & Dicataldo, 1989). Rebne (1990) later advised that since there is considerable evidence that occupations differ in forms of output, productivity measures should not be restricted to a single channel such as journal articles. However, he added "the literature has yet to produce a universally accepted measure of research performance" (p. 31).

Biglan (1973) noted that it was inadvisable to collect data on an organizational basis, rather than considering the variety of individual academic fields. Collection on an organizational basis had a tendency to mask the differences among the different academic areas. He also noted that studies restricted to one or a few academic areas were not generalizable to dissimilar academic areas. Biglan concluded that university-wide standards for the evaluation of faculty would not be possible.

Biglan (1973) and Rebne (1986) concluded that since there is a considerable

amount of evidence that the fields of study differ in their forms of output, productivity measures should not be restricted to a single publishing channel such as journal articles. However, the productivity measures that they suggested -- books, monographs, technical reports, and dissertations sponsored -- are relatively limited, and do not include a variety of potential measures of faculty productivity in the areas of instruction, research, service and administration.

Productivity is commonly defined as a ratio of output to input. Kopelman (1986) noted that in practice, most studies have measured the level of output rather than productivity. However, before productivity can be measured, valid measures of output and their relevant input measures must be identified.

Methodology

The population of the first part of the study consisted of faculty from the 200 institutions of higher education that have the highest levels of total separately budgeted science/engineering research and development expenditures, as reported in the National Science Foundation's (NSF) Surveys of Sciences Resources Series (1989). One thousand randomly-selected faculty from these institutions were sent a survey instrument entitled "Faculty Perceptions of Activity and Productivity Reporting" to obtain faculty perceptions of the accuracy and validity of, their willingness to participate in various time-related personnel activity reporting and productivity reporting systems, and to obtain their recommendations for measures of faculty productivity.

The faculty suggestions for methods of accounting for productivity, along with procedures that are currently being used by the same set of 200 institutions (obtained in a separate study) were incorporated into a follow-up

survey instrument entitled "Faculty Perceptions of Measures of Productivity". The original sample of 1,000 faculty, as well as an additional 1,000 randomly-selected faculty from institutions that ranked 201-400 in separately budgeted science/engineering research and development expenditures as reported in the NSF Surveys of Sciences Resources Series (1989), were asked to indicate their opinions of the validity of reporting faculty productivity on 203 measures of productivity for instruction (57 measures), research (74 measures), service (39 measures) and administration (33 measures).

The second survey instrument contains questions that result in data that is interval in nature. Means and standard deviations were calculated to determine the responding faculty's opinions regarding the validity of 203 measures of faculty productivity in the areas of instruction, research/creative activity, service and administration. The average measures of validity for productivity rated by responding faculty, were ranked for each of the functional categories of instruction, research, service and administration. In addition, measures of productivity that were rated among the top five valid measures for instruction, research/creative activity, service and administration productivity by either: 1) faculty that were funded or unfunded; 2) faculty from institutions that ranked 1-200 or 201-400; or 3) academic area, also were identified.

Results

Survey Responses - Faculty Perceptions of Activity and Productivity Reporting

The response rate from the 1,000 faculty from the top 200 institutions that were sent the first survey instrument was 24%.

Accuracy of after-the-fact activity reporting based on percentage of time.

On a scale of 1 through 6, with 1 being highly inaccurate and 6 highly accurate, responding faculty rate an after-the-fact self-report of their activity based on percentage of time between slightly and moderately accurate (4.54). Faculty opinions regarding the accuracy of their activity being reported after-the-fact based on percentage of time by other representatives of the institution were less highly rated. Those representatives, in order of level of reporting accuracy include the program director (3.50), department chair (3.33), department staff (3.15), dean's staff (2.40) and central administration (2.12). The faculty apparently do not perceive the institutions' tendency to have their time reported by other persons (Cooper, 1991), in order to comply with Personnel activity reporting (PAR) as required by the Federal government through the U.S. Office of Management and Budget's (OMB) Circular A-21, Cost Principles for Educational Institutions (1982), as an accurate reporting measure.

Validity of activity reporting based on percentage of time. Responding faculty do not regard reporting the percentage of time a faculty member spends in each work activity area as a very valid means for demonstrating to sponsors that their money was spent for the intended purposes. On a scale of 1 through 6, with 1 being highly invalid and 6 highly valid, responding faculty, on the average, rated this measure as lower than slightly valid (3.87).

Maximum level of time-related specificity. If faculty were required to keep a self-report of the time they spend on activities in order to receive funding from external sources, they are not willing to do it on a very specific level. Of the responding faculty, 23.5 percent indicated that the maximum level of specificity that they were willing to provide was an academic

term basis. Other respondents indicated that the maximum level of specificity that they were willing to provide, in order of frequency, included monthly (21.2 percent), weekly (19.0 percent), daily (10.6 percent), annually (9.7 percent), and hourly (7.9 percent). Only 0.5 percent of the responding faculty was willing to provide a self-report of time on a 15 minute basis, a basis that is commonly required of professionals billing out their time in private industry. An additional 7.8 percent of the responding faculty indicated that they were unwilling to document their activity in order to receive funding from external sources.

Accuracy of reporting productivity on measures other than time. Responding faculty regard the reporting of faculty productivity based on objective work measures other than time as slightly accurate (4.21).

Validity of reporting productivity on measures other than time. Responding faculty rated the validity of reporting faculty productivity based on objective work measures other than time slightly higher than the rating they had given to the validity of reporting time spent in each work activity area. On the average, responding faculty rated reporting faculty productivity on objective work measures other than time above slightly valid (4.27).

Maximum level of productivity reporting. If faculty were required to keep a self-report of productivity based on objective work measures in order to receive funding from external sources, they do not want to report those measures very frequently. Of the responding faculty, 27.6 percent indicated the maximum level of that frequency they would be willing to report this productivity information was each academic term, and 22.6 percent would be willing to report no more frequently than on an annual basis. While the

desired infrequency of these reports may be partially due to the faculty's desire to reduce the amount of administration and paperwork associated with reporting activities, the level of frequency also may be partially due to the fact that, in many instances, it takes at least an academic term or more to see any real results or products from the faculty's efforts.

Other respondents indicated the maximum level of frequency they would be willing to report this productivity information was, quarterly (11.5 percent), semi-annually (11.1 percent), monthly (11.1 percent), and upon project completion. An additional 7.4 percent of the responding faculty indicated that they were unwilling to document their productivity in order to receive funding from external sources.

Survey Responses - Faculty Perceptions of Measures of Productivity

The response rate from the 2,000 faculty from the top 400 institutions that were sent the second survey instrument was 21%. Of the responding faculty, the breakdown by the various areas of study is as follows:

1) faculty's externally funded project: funded - 49%; unfunded - 51%;

2) faculty's institutional funding rank: 1-200 - 52%; 201-400 - 48%;

3) faculty's academic area: Agriculture - 6%; Arts and Humanities - 23%; Business and Law - 8%; Education and Home Economics - 12%; Engineering - 10%; Physical Sciences and Math - 19%; Medical - 12%; and Social Sciences - 9%.

Responding faculty do not, on the average, rate the reporting of productivity based on any one measure as highly valid. On a scale of 1 through 6, with 1 being highly invalid and 6 highly valid, responding faculty, on the average, rated the following among the top five in terms of valid

measures of productivity for each of the functional categories of instruction, research, service and administration:

Instruction: # of new courses developed (4.83); increase in students' subject knowledge (4.81); # of programs/curricula developed (4.75); relevancy and currency of syllabi and materials (4.72); # of chaired theses/ dissertations completed (4.71); and # of new teaching techniques developed (4.71) (see Table 1).

Other measures that are rated among the top five valid measures of instructional productivity by either unfunded or funded faculty, faculty from institutions that ranked 1-200 or 201-400, or faculty from different academic areas include: # of theses/dissertations chaired; # of doctoral students instructed; # of curriculum innovations; # of courses significantly restructured; and success of students at next level (courses/work) (see Tables 1 and 2).

Research/creative activities: new knowledge created/problems solved (5.16); impact of research on discipline (5.15); # of refereed articles published (4.94); quality of outlet (4.91); and # of grants awarded (4.80) (see Table 1). The tendency to emphasize the number of refereed articles published in most productivity studies may be flawed. However, it may, at this time, remain as one of the simplest measures to document and compare.

Other measures that are rated among the top five valid measures of research/creative activity productivity by either unfunded or funded faculty, faculty from institutions that ranked 1-200 or 201-400, or faculty from different academic areas include: # of books published; # of monographs published; holder of distinguished chairs; # of patents issued; # of patents

Table 1: Faculty opinion regarding the validity of reporting faculty productivity based on: (by faculty's existence of external funding; faculty's institutional external funding rank; means of five top ranked measures). (1 = highly invalid; 6 = highly valid)

	Faculty External Funding				Institutional Funding Rank					
	Unfunded		Funded		1-200		201-400		TOTAL	
Response:	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
INSTRUCTION:										
35. # of new courses developed	4.85	1	4.82	3	4.77	2.5	4.90	1	4.83	1
22. Increase in students' subject knowledge	4.75	3.5	4.86	2	4.77	2.5	4.86	3	4.81	2
34. # of programs/curricula developed	4.82	2	4.68		4.62		4.89	2	4.75	3
37. Relevancy and currency of syllabi and materials	4.75	3.5	4.69		4.61		4.84	4	4.72	4
18. # of chaired theses/dissertations completed	4.49		4.95	1	4.79	1	4.62		4.71	5.5
33. # of new teaching techniques developed	4.71	5	4.70		4.66		4.77		4.71	5.5
17. # of theses/dissertations chaired	4.48		4.81	4	4.76	4	4.55		4.65	
9. # of doctoral students instructed	4.40		4.74	5	4.70	5	4.40		4.56	
32. # of curriculum innovations	4.70		4.65		4.57		4.79	5	4.67	
RESEARCH/CREATIVE ACTIVITY:										
113. New knowledge created/problems solved	5.21	1	5.11	1	5.21	2	5.11	1	5.16	1
112. Impact of research on discipline	5.19	2	5.10	2	5.22	1	5.08	2	5.15	2
58. # of refereed articles published	4.94	3.5	4.96	3	4.93	4	4.95	3	4.94	3
71. Quality of outlet	4.94	3.5	4.89	5	4.95	3	4.87	4	4.91	4
96. # of grants awarded	4.68		4.93	4	4.83	5	4.78	5	4.80	5
60. # of books published	4.74	5	4.74		4.71		4.76		4.73	

Table 1: (continued)

Response:	Faculty External Funding: Unfunded Mean	Unfunded Rank	Funded Mean	Funded Rank	Institutional Funding Rank: 1-200 Mean	1-200 Rank	201-400 Mean	201-400 Rank	TOTAL Mean	TOTAL Rank
SERVICE:										
141. # of journal editorships	4.83	1	4.76	1	4.81	1	4.80	1	4.80	1
156. Impact of the accomplishments	4.63	2	4.74	2	4.69	2	4.70	2	4.69	2
149. # of national events/conferences organized	4.42	5	4.52	3	4.50	3	4.44	3	4.48	3
142. # of reviews/jurying (publications, performances)	4.43	3.5	4.41	4	4.46	4	4.40	4	4.43	4
143. # of national committee/board memberships	4.41		4.38	5	4.43		4.36	5	4.40	5
132. # of university/college/dept committees chaired	4.43	3.5	4.26		4.39		4.31		4.35	
133. # of university/college/dept committees served	4.17		4.02		4.44	5	4.08		4.10	
ADMINISTRATION:										
191. Level of leadership provided	5.00	1	5.03	1	4.93	1	5.12	1	5.02	1
185. Morale of organization	4.81	2	4.75	2	4.76	2	4.80	3.5	4.78	2
189. Level of achievement	4.78	3	4.73	4	4.63	5.5	4.90	2	4.76	3
198. Effective budget management	4.72	4	4.74	3	4.67	3.5	4.80	3.5	4.74	4
186. Reputation of organization	4.64	5	4.71	5	4.67	3.5	4.68	5	4.67	5
181. Evaluations by faculty	4.62		4.57		4.63	5.5	4.55		4.59	

Table 2: Faculty opinion regarding the **validity** of reporting faculty productivity based on: (by academic area; means of five top ranked measures). (1 = highly invalid; 6 = highly valid)

	Agriculture		Arts and Humanities		Business and Law		Education & Home Ec		Engineering		Phys Sci & Math		Medical		Soc Sci		TOTAL	
Response:	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
INSTRUCTION:																		
35. # of new courses developed	4.28		4.83	2	4.88	4	4.98	1.5	4.71	2	4.80	2	5.06	3	4.90	3	4.83	1
22. Increase in students' subject knowledge	4.77	2	4.86	1	4.93	3	4.47		4.44		4.92	1	5.07	2	4.95	2	4.81	2
34. # of programs/curricula developed	4.27		4.81	3.5	4.73		4.98	1.5	4.39		4.69	4	5.02	4	4.87	4	4.75	3
37. Relevancy and currency of syllabi and materials	4.52	5	4.74	5	4.94	2	4.73	5	4.26		4.63		4.89		5.08	1	4.72	4
18. # of chaired theses/ dissertations completed	4.81	1	4.40		4.87	5	4.72		4.88	1	4.77	3	4.86		4.77		4.71	5.5
33. # of new teaching techniques developed	4.42		4.67		4.70		4.85	4	4.44		4.66		5.11	1	4.77		4.71	5.5
17. # of theses/dissertations chaired	4.58	4	4.42		5.00	1	4.90	3	4.66	4	4.63		4.68		4.67		4.65	
9. # of doctoral students instructed	4.39		4.24		4.83		4.67		4.67	3	4.68	5	4.74		4.47		4.56	
32. # of curriculum innovations	4.08		4.81	3.5	4.70		4.67		4.54	5	4.55		4.92		4.85	5	4.67	
24. Success of students at next level (courses/work)	4.65	3	4.39		4.34		4.38		3.98		4.62		4.44		4.28		4.40	
36. # of courses significantly restructured	4.39		4.63		4.70		4.66		4.48		4.43		4.94	5	4.77		4.62	
RESEARCH/CREATIVE ACTIVITY:																		
113. New knowledge created/ problems solved	4.84	1	5.23	1	5.24	2	4.93	3	4.90	1	5.39	2	5.11	2	5.32	1	5.16	1
112. Impact of research on discipline	4.76	2	5.21	2	5.17	3	5.00	2	4.87	2	5.41	1	5.16	1	5.15	2	5.15	2
58. # of refereed articles published	4.68	3	4.96		5.27	1	4.89	4	4.56		4.98	4	4.96	4	5.10	3	4.94	3

Table 2: (continued)

Response:	Agriculture Mean	Agriculture Rank	Arts and Humanities Mean	Arts and Humanities Rank	Business and Law Mean	Business and Law Rank	Education & Home Ec Mean	Education & Home Ec Rank	Engineering Mean	Engineering Rank	Phys Sci & Math Mean	Phys Sci & Math Rank	Medical Mean	Medical Rank	Soc Sci Mean	Soc Sci Rank	TOTAL Mean	TOTAL Rank
RESEARCH/CREATIVE ACTIVITY:																		
71. Quality of outlet	4.54	4	5.09	3	5.00	4	4.77		4.83	3	4.95	5	5.07	3	4.71		4.91	4
96. # of grants awarded	4.32		4.63		4.85		5.07	1	4.70	4	4.99	3	4.78	5.5	4.92	4	4.80	5
60. # of books published	4.52	5	5.04	4	4.75		4.81		4.42		4.55		4.69		4.74		4.73	
61. # of monographs published	4.40		5.03	5	4.64		4.49		4.39		4.58		4.43		4.82	5	4.66	
120. Holder of distinguished chairs	4.17		4.63		4.39		4.82	5	4.27		4.63		4.78	5.5	4.35		4.56	
123. # of patents issued	3.80		4.22		4.95	5.5	4.72		4.45		4.55		4.39		4.05		4.41	
128. # of scholarly awards and honors received	4.42		4.78		4.73		4.59		4.59	5	4.80		4.53		4.58		4.67	
124. # of patents commercialized	4.00		3.82		4.95	5.5	4.66		4.26		4.00		4.16		3.48		4.12	
SERVICE:																		
141. # of journal editorships	4.56	1	4.76	1	5.12	1	4.98	1	4.49	2	4.87	2	4.74	2	4.86	1	4.80	1
156. Impact of the accomplishments	4.25	2	4.73	2	4.59	3	4.74	3	4.50	1	4.89	1	4.89	1	4.47	2	4.69	2
149. # of national events/ conferences organized	4.21	5	4.41	4	4.52	4	4.78	2	4.28	4	4.65	3	4.50	5	4.17		4.48	3
142. # of reviews/jurying publications, performances	4.24	3	4.50	3	4.76	2	4.49		4.00		4.51	4	4.43		4.28		4.43	4
143. # of national committee/ board memberships	3.88		4.40	5.5	4.41	5	4.58		4.22	5	4.46	5	4.51	4	4.40	3	4.40	5
138. # of professional committees /boards chaired	4.12		4.24		4.38		4.67	4	4.34	3	4.40		4.45		4.33	5	4.37	
132. # of university/college/ dept committees chaired	3.88		4.40	5.5	4.33		4.64	5	4.10		4.39		4.33		4.39	4	4.35	
157. Provision of service to practitioners	4.05		4.04		4.27		4.54		3.99		4.16		4.68	3	4.04		4.23	
165. # of technical assistance to business/gov't/individual	4.23	4	3.68		4.07		4.07		3.93		3.88		3.94		3.97		3.92	

Table 2: (continued)

Response:	Agriculture Mean	Agriculture Rank	Arts and Humanities Mean	Arts and Humanities Rank	Business and Law Mean	Business and Law Rank	Education & Home Ec Mean	Education & Home Ec Rank	Engineering Mean	Engineering Rank	Phys Sci & Math Mean	Phys Sci & Math Rank	Medical Mean	Medical Rank	Soc Sci Mean	Soc Sci Rank	TOTAL Mean	TOTAL Rank
ADMINISTRATION:																		
191. Level of leadership provided	4.33		4.99	1	4.74	2	5.18	1	4.85	1	5.22	1	5.24	1	5.06	1	5.02	1
185. Morale of organization	4.54	2.5	4.83	2	4.41		4.84	2	4.60	3	4.99	2	4.87	4	4.67	4	4.78	2
189. Level of achievement	4.50	5	4.76	4	4.79	1	4.83	3	4.47	5	4.96	3	4.79		4.69	3	4.76	3
198. Effective budget management	4.65	1	4.78	3	4.43		4.77	4	4.55	4	4.75	5.5	4.98	2	4.71	2	4.74	4
186. Reputation of organization	4.46		4.69		4.36		4.67	5.5	4.64	2	4.92	4	4.77		4.42		4.67	5
181. Evaluations by faculty	4.54	2.5	4.74	5	4.10		4.66		4.36		4.63		4.86	5	4.40		4.59	
184. Impact of administration on unit	4.52	4	4.53		4.26		4.67	5.5	4.20		4.75	5.5	4.64		4.34		4.53	
193. # of accomplishments	4.35		4.48		4.47	4	4.44		3.95		4.65		4.57		4.57	5.5	4.46	
199. Cost effectiveness	4.35		4.54		4.19		4.52		4.32		4.58		4.94	3	4.41		4.52	
190. Level of support provided	4.14		4.47		4.54	3	4.60		4.31		4.61		4.67		4.36		4.50	
188. Level of advancement over time	4.04		4.12		4.45	5	4.48		4.23		4.39		4.49		4.07		4.29	
192. # of problems solved	4.13		4.33		4.41		4.25		3.97		4.72		4.61		4.57	5.5	4.41	

commercialized; and # of scholarly awards and honors received (see Tables 1 and 2).

Service: # of journal editorships (4.80); impact of the accomplishments (4.69); # of national events/conferences organized (4.48); # of reviews/ jurying of publications/performances (4.43); and # of national committee/board memberships (4.40) (see Table 1).

Other measures that are rated among the top five valid measures of service productivity by either unfunded or funded faculty, faculty from institutions that ranked 1-200 or 201-400, or faculty from different academic areas include: # of university/college/department committees chaired; # of university/college/department committees chaired; # of professional committees/boards chaired; provision of service to practitioners; and # of technical assistances to business/government/individuals (see Tables 1 and 2).

Administration: level of leadership provided (5.02); morale of organization (4.78); level of achievement (4.76); effective budget management (4.74); and reputation of organization (4.67) (see Table 1).

Other measures that are rated among the top five valid measures of administration productivity by either unfunded or funded faculty, faculty from institutions that ranked 1-200 or 201-400, or faculty from different academic areas include: evaluations by faculty; impact of administration on unit; cost effectiveness; # of accomplishments; # of problems solved; level of advancement over time; and level of support provided (see Tables 1 and 2).

Summary, Conclusions and Recommendations

Reporting the percentage of time the faculty spend in various activities, or the number of hours the faculty spend in the classroom, masks the true

accomplishments of the faculty. The reliance upon time-based reporting systems prevails despite the fact that no study has demonstrated the direct correlation between these reporting measures and faculty productivity. However, unless institutions of higher education and faculty become accountable to their sponsors, and begin to develop, implement, and make external, as well as internal, reports based on measures of faculty productivity, they will continue to have these invalid time-based measures imposed upon them by external sources.

Faculty, in particular, must change their attitude toward a serious reporting to the public of what they are doing. They are no longer in an "ivory tower" where they have to be accountable to no one but themselves. Their research and instructional activities have become, over the years, heavily based upon the foundation of public support. Reporting their findings or results to their colleagues in a journal or at a conference is not enough. If the faculty expect the public to continue to support their activities, the faculty must accept the fact that they must be accountable to the public for those activities.

Despite the fact that there is an explicit need to have a major change in the faculty's attitude regarding the necessity of reporting of their productivity, it will be very difficult for administrators to convince the faculty to record measures of productivity accurately and to report it in time periods that will allow the results to be accurate and valid. If faculty expect external funding sources to continue to provide the financial foundation for their activities, they must, in turn, be willing to give something tangible back to their supporters.

Part of the faculty's reluctance to participate in time-based reporting measures is that they do not find them to be accurate or valid measures. Prior to this study, no one had bothered to ask the faculty what they consider to be valid measures of productivity. This study specifically asked the faculty to identify those methods of accounting for faculty productivity that they felt were better than time-based measures at demonstrating to sponsors that their money was spent for the intended purposes, and then assess the validity of these various measures for accounting for faculty productivity. The results of the second part of this study, which presents the opinions of more than 400 faculty, provide the higher education community with a set of opinions related to measures of faculty productivity that could provide the relevant philosophical base related to a new set of premises, that will allow information gathering related to valid and acceptable measures of productivity, and that could be provided to sponsors and the general public to demonstrate that their funds have been well spent and used for their intended purposes.

In the further development of the internal/external productivity reporting systems, the faculty's opinions on what they feel are valid measures of productivity for their own jobs should be given serious consideration by university administrators, sponsors and public officials mandating such reporting.

It is apparent from the results of the second survey, "Faculty Perceptions of Measures of Productivity", that faculty do not, on the average perceive any single output measure as highly valid. This may be due to the fact no single measure is rated as highly valid by all respondents, but it also could be due

partially to the fact that several faculty noted that no single measure is a good indicator of faculty productivity. Faculty have a multitude of responsibilities within each of the functions of instruction, research, service and administration, and limiting the analysis of their productivity to a few measures would not present a full picture of their efforts.

The tendency to emphasize the number of refereed articles published in most productivity studies may be flawed. However, it may, at this time, remain as one of the simplest measures to document and compare. Some of the output measures rated as highly valid provided by the faculty, such as impact of the research on the discipline or level of leadership, would be extremely difficult to document, quantify or evaluate. Further research is needed to determine ways to document, quantify or measure some of these other measures. Methods for taking into account the quality of the output, as well as quantity, also should be developed.

It is recommended that the second survey instrument, "Faculty Perceptions of Measures of Productivity," be redistributed to faculty from other types of institutions of higher education. It is very likely that these output measures could be rated differently by faculty at other types of institutions of higher education that have less of a focus on research and more of an instructional/service orientation. Before these output measures could be applied to such instructional/service-oriented institutions, the study would have to be replicated at these institutions.

University administrators and external sponsors also should be surveyed to determine if their expectations for faculty output are related to, or in opposition with, faculty intentions. Other assessment constituencies, such as

accrediting agencies, coordinating boards, regents, parents and students, also could be surveyed for their impressions of these measures of faculty productivity.

If a more universally accepted set of output measures can be identified, these measures should be used to:

1. document productivity by correlating these output measures to relevant input measures. This will require the additional analysis of which input measures are relevant and should be correlated with what output measures.
2. test whether or not there is indeed a correlation between productivity in terms of outputs produced per unit of time.
3. attempt to determine the relevant worth of one unit of output in one area versus another (i.e., is one refereed journal article equivalent to two non-refereed journal articles or the instruction of a class of 30 students). This "relevant worth" may need to vary across disciplines and institutions.

In 1929, Reeves and Russell concluded that the evaluation of "faculty load" was an extremely difficult problem, that existing measures of faculty productivity were unsatisfactory and incomplete, but that some measure must be employed. Thirty years later, Stickler (1960) conceded that the situation had not changed. Unfortunately, another thirty years has passed, with little advancement. This study has been an attempt to rectify that problem by presenting the faculty's perceptions of various measures of faculty productivity.

REFERENCES

Biglan, A. (1973). Relationship between subject matter characteristics and the structure and output of university departments. Journal of Applied Psychology, 57(2), 204-213.

Cooper, P. A. (1991). A characterization and analysis of faculty activity and productivity reporting systems in research universities. Unpublished doctoral dissertation, Texas Tech University.

Creswell, J. W. (1985). Faculty research performance: Lessons from the sciences and the social sciences (ASHE-ERIC Higher Education Report No. 4). Washington, D.C.: Association for the Study of Higher Education; ERIC Clearinghouse.

Ingster, B. (1977). Academic productivity--Can it be measured? The Journal of the College & University Personnel Association, 28(4), 9-14.

Kopelman, R. (1986). Managing productivity in organizations: A practical, people-oriented perspective. New York: McGraw-Hill.

Kurz, R. S., J. J. Mueller, J. L. Gibbons, & Dicataldo, F. (1989). Faculty performance: Suggestions for the refinement of the concept and its measurement. The Journal of Higher Education, 60(1), 21-58.

National Science Foundation. (1989). Academic science/engineering: R&D funds fiscal year 1988. NSF 89-326. Washington, D.C.

Rebne, D. S. (1986). The Biglan model of disciplinary differences and publishing patterns in academe. Unpublished manuscript. Anderson Graduate School of Management, UCLA.

Rebne, D. (1990). Determinants of individual productivity: A study of academic researchers. Los Angeles, CA: Institute of Industrial Relations,

University of California, Los Angeles, California.

Reeves, F. W., & Russell, J. D. (1929). Instructional loads. In College organization and administration (pp. 165-82). Indianapolis, IN: Board of Education, Disciples of Christ.

Stickler, W. H. (1960). Working material and bibliography on faculty load. In K. Bunnell (Ed.), Faculty work load (pp. 80-97). Washington, D.C.: American Council on Education.

Swann, C. C., Saunders, L., Simpson, W., & Wooley, G. (1977). Faculty activity analyses. College and University, 52(4), 760-764.

U.S. Office of Management and Budget. (1979, revised 1982, 1986). Circular A-21, cost principles for educational institutions. Washington, D.C.